A NEW CURRENT INTERRUPTER FOR INDUCTION COILS.

MAY I call attention to the most remarkable electrolytic current interrupter due to Dr. A. Wehnelt, of Charlottenburg, which appears to me to be by far the most important improvement that has been made in connection with Ruhmkorff induction coils for many years. From a description in the *Electrical Review* for February 17 we have made in this laboratory one of these appliances, and tried it on a 10-inch Apps coil. The apparatus is of extreme simplicity, consisting merely of a glass vessel filled with dilute sulphuric acid, into which dip two electrodes. One of these is a plate of lead of considerable area. The other is a glass tube, through the end of which protrudes a short piece of platinum wire, sealed into the glass. The glass tube is open at the other end, and is filled with mercury, into which is dipped one of the wires from a source of continuous electric current; in our case the mains of the Westminster Electric Supply Company. The glass tube is immersed in the acid so that the platinum wire is some distance below the surface, and is within half an inch or so of the lead plate. No condenser is employed, the primary terminals of the coil being directly connected to the supply mains (100 volts) through the electrolytic cell, the positive current being arranged to pass through the cell from the platinum wire to the lead. On turning on the current a rapidly intermittent arc is seen to take place in the vicinity of the platinum wire, apparently between the latter and the dilute acid. Judging from the loud hum, the frequency must be some hundreds per second. At the same time, between the terminals of the secondary of the coil placed some five or six inches apart, a perfect torrent of sparks takes place, which follow one another so fast that the stream appears to be almost continuous. The effect is in fact very similar to that produced with a Tesla high frequency coil, but is much more constant and much less diffuse, while the stream of sparks curls about in a curious and distinctive manner, emitting all the time a very loud and continuous note.

The arrangement seems likely to have wide and important applications in connection with Röntgen-rays, wireless telegraphy, and many other purposes. It is a distinct step towards obtaining, from continuous currents, alternating currents of any desired high frequency without the necessity of moving parts. A. A. C. SWINTON.

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NOTES.

IN view of the advancement of zoological science to be expected from researches in the South Polar Lands and Seas, the Council of the Zoological Society of London have agreed, on the part of the Society, to contribute a sum of 200*l.* to the funds of the National Antarctic Expedition.

THE seventh "James Forrest" lecture of the Institution of Civil Engineers will be delivered by Prof. J. A. Ewing, F.R.S., on Thursday, April 20, at eight o'clock, the subject being "Magnetism." The lecture will be repeated on Friday, April 21, at four o'clock, for the benefit of members and their friends.

WE regret to announce that Dr. William Rutherford, F.R.S., professor of physiology in the University of Edinburgh, died on Tuesday morning, at sixty years of age.

AT the annual meeting of the Russian Geographical Society, on February 2, the following medals were awarded:—The Constantine medal to Dr. Gustav Radde, the director of the Tiflis Museum, for his forty-five years' work in the study of Russia; the Count Lütke medal to I. I. Pomerantseff, for his researches into the forms of the earth's geoid in the province of Fergana; the Semonoff medal to M. Kleiber, for his investigations into the periods of high water in the Volga; the great gold medal of the Section of Ethnography to N. L. Gondatti, for his three years' work of exploration of the Land of the Chuckchis; the Przewalski medal to L. A. Jaczewski, for his physico-geographical researches in Siberia; and three small gold medals to M. Tachaloff, for his instruction of travellers in astronomical observations; A. A. Rostkovsky, for a map of population in the Bitol vilayet of Turkey; and N. A. Zarudnyi, for researches in Persia; a number of silver medals were awarded for minor works.

THE Reale Istituto Lombardo announces in its *Rendiconti* the award of prizes as follows:—The Cagnola prize of 2500 lire and a gold medal of 500 lire has been awarded to Signor Angelo Battelli and Signor Annibale Stefanini for their joint paper containing a critical exposition of electric dissociation considered principally in regard to the experimental proofs of its deductions. For the Kramer prize, on an essay relating to the use of condensers in the transmission of electric energy by alternating currents and their construction for industrial purposes, two competitors entered, and prizes of 2500 lire and 1500 lire respectively have been awarded to Prof. Luigi Lombardi, of Turin, and Signor Giovanni Battista Folco, director of the electric tramways of Leghorn. For the Fossati prize, on some physiological point connected with the human encephalus, two competitors entered, and awards of 400 lire have been made to both—namely Dr. Domenico Mirto, of Palermo, and Dr. Carlo Martinotti, of Turin. For the Brambilla prize, given for the invention or introduction of some new machine or industrial process of real practical value, seven competitors entered. A gold medal and 500 lire has been awarded to Fratelli Boltri, of Milan, for their grain desiccators; a similar award to Premoli and Zanoncelli, of Lodi, for their preparation of Gaertnerised milk. Gold medals and 200 lire have also been given to Rossi, Enrico, and Co., of Milan, for their manufacture of varnishes, &c.; to Piola Alfredo, of Milan, for artists' colours; and to Pizzoni Pietro, of Milan, for the manufacture of baskets.

THE prizes offered by the Reale Istituto Lombardo for future competition include prizes of the Institution for 1899 for a list of unusual meterological events that have been recorded from the earliest times, and for 1900 for an essay on collective property in Italy; two triennial medals for improvements in agricultural or industrial processes in Lombardy; a Cagnola prize and gold medal on the subjects chosen by the Institution, viz. in 1899, for an essay on Hertz's phenomenon, or the effect of active radiation or of products of combustion on the sparking distance in air, and in 1900 for a critical study of toxin and antitoxin; a Cagnola prize and gold medal for 1899 on one of the following subjects chosen by the founder: viz. the cure of "pellagra," the nature of miasma and contagion, the direction of flying balloons, and the methods of preventing forgery of writings; a Brambilla prize for industrial improvements in Lombardy; Fossati prizes for 1899 on the macro- or micro-scopical anatomy of the nervous system, for 1900 on the regeneration of peripheric nervous fibres in vertebrates, and for 1901 on the anatomy of the encephalus of the higher animals; a Kramer prize for an essay on the transmission of heat between the steam and walls of the cylinders of steam-engines; a Secco Comneno prize for 1902 for a description of Italian natural deposits of phosphates; a Pizzamiglio prize for an essay on the influence of socialistic doctrines on private rights; Ciani prizes for popular Italian books, a Tommasoni prize for a history of the life and works of Leonardo da Vinci; and a triennial Zanetti prize for some improvement or discovery in pharmaceutical chemistry.

The Prince of Wales has accepted the office of President of the National Association for the prevention of consumption and other forms of tuberculosis.

The annual meeting of the Society for the Protection of Birds will be held next Tuesday, February 28. The chair will be taken by Sir Edward Grey, Bart., M.P.

Mr. J. Hookey has been appointed to succeed Mr. W. H. Preece, C.B., F.R.S., as engineer-in-chief of the Post Office, and Mr. J. Gavey has been appointed assistant engineer-in-chief and electrician.

Prof. Karl Müller, one of the founders of *Die Natur*, the well-known German scientific weekly, and the editor of it until about three years ago, died on February 9, at the age of eighty-one. His botanical researches and many scientific writings have contributed much to the advancement of science.

The Governor of Yeniseisk states that the native report regarding the Andrée expedition has been in no way confirmed either in Yeniseisk or in the region under the supervision of the inspector of mines for the northern Yeniseisk district. Though an exhaustive search has been made on the Upper Pit River, no traces of the expedition have been found.

We learn from the *British Medical Journal* that the Paris Académie de Médecine is about to build itself a new house on a palatial scale. The plans have been drawn by M. Rochet, and all the architects who have seen them are said to have been unanimous in declaring that the building will be one of the finest in Paris. It is expected to be completed in two years.

The International Congress of Mathematicians at Paris in 1900, of which a brief announcement appears in the *Revue Générale des Sciences* for February 15, promises to be one of the most important of coming events in the mathematical world. The Congress, which will be in conjunction with the Paris Exhibition from the 6th to the 12th August, will probably hold most of its meetings at the Sorbonne. Already upwards of 910 members and others have announced their intention to be present. The price of the tickets of membership has been fixed at thirty francs.

Mr. Stanley Flower seems to be making good progress with the reorganisation of the Zoological Garden at Gizeh, near Cairo, of which he has lately been appointed director. An Indian elephant has been received from Calcutta, and a fine specimen of the Gangetic crocodile has been presented by Captain Henderson, of the s.s. *Manora*. Large series of aquatic birds have also been lately obtained from Damietta, and have added much to the lively appearance of the garden, which is now much frequented by visitors from Cairo.

The last letters received from Mr. John S. Budgett, who has been sent out on a scientific mission to the Gambia by the Zoological Society of London, are dated from Nianimaru, on the Gambia, about thirty miles below McCarthy Island, January 23. They announce that Mr. Budgett, who was in excellent health, was busily engaged in collecting fishes and birds. Of *Polypterus*, one of the objects of his special inquiries, he had obtained some large specimens, one of which was found to contain large ova. The Manatee (*Manatus senegalensis*) had been ascertained to ascend the river thus far.

The anniversary meeting of the Geological Society was held at Burlington House on Friday last, February 17. The officers were appointed as follows:—President, Mr. William Whitaker, F.R.S.; vice-presidents, Dr. Henry Hicks, F.R.S., Prof. J. W. Judd, C.B., F.R.S., Prof. W. J. Sollas, F.R.S., and Rev. H. H. Winwood; secretaries, Mr. R. S. Herries and Prof. W. W. Watts; foreign secretary, Sir John Evans, K.C.B., F.R.S.; treasurer, Dr. W. T. Blanford, F.R.S. The medals and funds were awarded as announced on January 19 (p. 275). The President delivered his anniversary address, which dealt with various subjects in which geology has practical application.

At the meeting of the Chemical Society on Thursday last, the President announced that Mr. C. E. Groves, F.R.S., had resigned the editorship of the Society's *Journal*, and that Dr. W. P. Wynne, F.R.S.. had been selected to succeed him. The Council had recorded their sense of Mr. Groves' services to the Society in a vote of thanks, a copy of which would be engrossed on vellum and presented to him. It was announced that the following changes in the officers and Council were proposed by the Council: As president—Prof. T. E. Thorpe, F.R.S., *vice* Prof. James Dewar, F.R.S. As vice-presidents—Mr. C. E. Groves, F.R.S., and Prof. Thomas Purdie, F.R.S., *vice* Prof. F. R. Japp, F.R.S., and Prof. W. A. Tilden, F.R.S. As hon. secretary—Dr. Alexander Scott, F.R.S., *vice* Dr. W. P. Wynne, F.R.S. As hon. treasurer—Prof. W. A. Tilden, F.R.S., *vice* Prof. T. E. Thorpe, F.R.S. As ordinary members of Council—Mr. H. Brereton Baker, Prof. F. Clowes, Dr. G. T. Moody, and Prof. James Walker, *vice* Prof. Bedson, Mr. Hehner, Prof. McLeod, F.R.S., and Dr. Scott, F.R.S.

Referring to the recent landslip at Airolo, a Reuter telegram from Berne says: "With the weather becoming warmer fresh falls of rock have occurred at Sasso Rosso, near Airolo, one of them being of considerable magnitude. These falls confirm the view taken by geologists that the further slides will not take place all at once, but in sections varying in bulk from 5000 to 10,000 cubic metres. The fresh masses fell on the present accumulation of débris without causing any damage. The St. Gothard Railway is not endangered, and there is no question of the traffic being interrupted."

We learn from *Science* that the Physical Society of Berlin, established in 1845, has decided to be known as the German Physical Society. The object of the Society is to advance physical science by the following means: (1) the publication of *Proceedings*, especially, for the prompt issue of short communications. (2) The publication of a year-book on the progress of physics. (3) Co-operation in the publication of the *Annalen der Physik und Chemie*. (4) Participation in the meetings of the Section of Physics, of the German Society of Men of Science and Physicians. (5) Regular meetings in Berlin, and (6) a journal club.

In 1894 the Goldsmiths' Company made a grant of 1000*l.* to the conjoint Board of the Royal Colleges of Physicians and Surgeons for the purpose of further experiments in connection with the anti-toxin treatment of diphtheria, with the stipulation that a supply of the best possible serum should be supplied for the gratuitous treatment of poor patients, especially children, suffering from diphtheria. In a report to the Company, Sir Walter S. Prideaux has expressed the opinion that the Company would take a wise and beneficent step if they were to make a further grant to the conjoint Board, adding, "There can be no question that the grant made in 1894 has proved not only of much importance to science, but has also been of great value to suffering humanity amongst the poorer classes." Upon consideration of the report the Goldsmiths' Company have made a further grant of 500*l.* to the conjoint Board, making the same stipulation as before, that a supply of the best possible serum shall be supplied for the gratuitous treatment of poor patients.

The Rev. M. Dechevrens, S.J., director of the St. Louis Observatory, Jersey, has sent us a letter with reference to Mr. W. H. Dines's recent paper on the connection between the winter temperature and the height of the barometer in north-west Europe. Mr. Dines concludes, and M. Lancaster, of Brussels, agrees with him (see p. 377), that in winter it is just as likely to be cold when the barometer is below the average as when it is above the average. This result is opposed to the current theory, but the Rev. M. Dechevrens holds that the phenomena concerned are only an extension of the general theory of variations of temperature in cyclones which he has for some years been bringing before the attention of meteorologists. A brief description of his conclusions as to the variations of air temperature in cyclones, and their cause, will be found in NATURE of July 28, 1898 (vol. lviii. p. 301).

DURING the fine weather of last week Mr. Walter Garstang successfully accomplished the first of his periodic surveys of the physical and biological conditions of the English Channel for the current year, an investigation in which he has been assisted by a grant from the British Association and by the use of apparatus belonging to the Government Grant Committee of the Royal Society and the Marine Biological Association. Mr. Garstang left Plymouth on Friday last in the steam tug *Stormcock*, and returned home late on Sunday. Stations were established in mid-Channel (50 fathoms), off Ushant (60 fathoms), off Parsons Bank, seventy miles west of Ushant (80 fathoms), and off Mounts Bay (50 fathoms). Serial temperature soundings were taken, and collections of plankton were made at the surface and in 40 fathoms at each of these stations. The deep water plankton collections were made by means of a pump and 40 fathoms of armoured suction hose. Surface collections were also made with the same apparatus. The quantity of water pumped on each occasion was determined with all possible accuracy, and the filtered samples were preserved for future examination without accident, thus admitting of a quantitative analysis for a comparative statement of the results obtained. Surface collections were also made at each station by means of tow-nets for comparison with the results obtained by the pump. A heavy ground swell, crossed by a stiff north-westerly breeze, was encountered between Ushant and Parsons Bank, but in other respects the weather was all that could be desired. The temperature results display a remarkable uniformity for all depths at each of the stations. The warmest water was met with to the westward, while the mid-Channel water was found to be warmer than that bathing the English and French coasts, thus confirming Mr. H. N. Dickson's results as to the course of the axis of high temperature in the Channel. It is intended to repeat the investigation at the same stations during May, August and November of the present year, in order to provide material for a complete account of the seasonal changes, as well as the horizontal and vertical distribution of plankton and temperature in this region of the Channel.

FROM a report in the *Adelaide Chronicle*, it seems that the iguana lizard, hitherto supposed to be perfectly harmless, except in poultry yards, has been found to be the slaughterer of lambs. Several sheep-owners have caught the iguana in the act of killing lambs, so there can be no doubt that this reptile must now be classed amongst the enemies of the pastoralists. The scarcity of opossums has probably driven the iguana to attack lambs for food. Pastoralists, who since the discovery have watched their lambs closely, say that even very small iguanas will attack a lamb, and they further state that any lamb so bitten will not recover.

THE presidential addresses delivered before the various sections of the American Association at the forty-seventh meeting and fiftieth anniversary, held at Boston, Massachusetts, last August, and abstracts of the papers communicated, are printed in the volume of *Proceedings* (vol. xlvii.), which has just been published by the permanent secretary, Dr. L. O. Howard. The volume runs into 658 pages, and contains many papers of scientific interest and value. This year's meeting of the Association will be held at Columbus, Ohio, the president for the meeting being Prof. Edward Orton, of Ohio State University.

THOUGH the age of the implements or "palæoliths" from the Trenton gravels has been the subject of much controversy, little attention appears to have been given to the human remains from the same beds. Dr. Frank Russell has, therefore, made a detailed study of these remains in order to determine whether or not they resemble the remains of recent Indians of the region. The Delaware Valley was occupied by the Lenni Lenapé until 1737; and Dr. Russell concludes that the crania found near the surface, at least about Trenton, are the skulls of members of this tribe, or of other modern Indians. The paper in which the remains are discussed appears in the *American Naturalist*.

EXPERIMENTS to determine the density of ice are described, by Prof. Edward L. Nichols, in the January number of the *Physical Review*. From his own investigations, Prof. Nichols concludes that the natural ice he used in the form of air-free icicles, and in the massive form of ice-blocks cut from the surface of a frozen pond, had a density at 0° of 0·9180. Artificial ice produced by the use of carbon dioxide and ether was found to have a density not far from 0·9161. There appears to be no doubt that natural ice obtained from the surface of frozen ponds and rivers and in the slow formation of icicles possesses a density greater than that of artificial ice by about two parts in a thousand.

MR. CHARLES S. TOMES, F.R.S., describes, in the *Quarterly Journal of Microscopical Science*, an investigation on the differences in the histological structure of teeth of fishes of the family Gadidæ. The object of the investigation was to ascertain the extent of the variation in structure of the teeth of various Gadidæ, and to see how far these differences coincide with the lines of classification on general grounds. The conclusion arrived at is that the differences of tooth structure only to a limited extent follow the lines of the general affinities of the genera. Mr. Tomes also remarks: "The teeth of the Gadidæ appear to furnish an argument against the adequacy of the purely mechanical theory of the evolution of tooth forms, so warmly advocated by Cope under the name of kinetogenesis, and adopted in its entirety by a large number of the American school of naturalists."

THE Pilot Chart of the North Atlantic Ocean, issued by the Hydrographic Office of the United States for February, reviews the state of the weather from December 20 to January 20. In many localities the weather in the Atlantic was very severe; gales of hurricane force accompanied with violent squalls were frequently reported. The tracks of fifteen storms are traced upon the chart; the centres of these disturbances were for the most part to the north of the transatlantic routes, moving north-eastward, and following each other in rapid succession. Several of them are shown to have traversed the whole of the North Atlantic. Nearly all of them passed to the northward of our islands, although their influence would be felt on our extreme north-west coasts. The principal exception was the storm which was central over England on December 29, which after reaching longitude 30° W., took a nearly direct westerly course; this disturbance developed off the American coast on December 26. Reports from the Newfoundland coast indicate a rapid southerly movement of the Arctic ice floe. Some immense icebergs were reported 200 miles S.E. of St. John's, Newfoundland, in the latter part of January, directly in the track of shipping.

ABOUT four years ago, Prof. Wilhelm von Bezold pointed out, from theoretical considerations, that both winter and night thunderstorms, compared with summer and afternoon thunderstorms, should be much more frequent on the sea and the coasts than inland, but that this effect could scarcely be expected in the case of sea-coasts where the paths of the cyclones are generally from the land to the sea. The work of Messrs. Mohn and Hildebrandson on Norway and Sweden, and of Dr. Meinardus on the open sea, is in general agreement with this theory, as also are other more or less complete reports for different places. Prof. H. D. Stearns has made a further investigation of the subject, and gives his results in the U.S. *Monthly Weather Review.* His tables and curves, showing monthly percentages of thunderstorms on coasts and inland in various parts of the world (the British Isles included), establish a general law that the percentage of winter thunderstorms decreases in passing from a coast inland in the general direction of the prevailing cyclonic winds.

THE spectroscopic analysis of minerals is in most cases undertaken by using the electric spark as the heat source for volatilising the substance. Considerable difficulty is experienced in the case of those minerals which are non-conductors, such as the felspars. M. A. de Gramont (*Bull. de la Soc. Franc. de Mineralogie,* March, April, and May 1898) has overcome this by first mixing some easily fusible salt with the powdered mineral, and then heating the mixture with a Bunsen burner, when the mineral is generally dissolved in the salt, and the electric spark is passed from the mass while molten. In most cases, he uses one or more Leyden jars in the secondary circuit to raise the temperature sufficiently. The salts he finds best adapted are the carbonates of lithium and sodium, chiefly on account of the simplicity of their spectra, which have, of course, to be eliminated from the results before the spectrum of the mineral itself can be mapped. For this purpose he gives tables of the principal wave-lengths in the spectra of these salts, and also of the more commonly occurring simple bodies. He then describes in detail the characteristics of the spectra observed with the non-conducting minerals, of which he has examined some twenty-five different specimens.

FROM a paper dealing with the mica mines in Bengal, contributed by Mr. A. Mervyn Smith at the meeting of the Institution of Mining and Metallurgy on February 15, it appears that the industry is a very ancient one, the methods of mining the mica and preparing it for market having been in use for centuries. The mica occurs in pegmatite veins running through foliated rocks, and is taken out from open cuts made in the decomposed granite, and abandoned as soon as solid rock is reached. The miners are a local tribe called Bandathis, men, women and children all working at the mines in the dry months when there is no agricultural work in the fields to be done. The books of mica are chiselled out, the work being aided by large fires when the pegmatite is hard, and split into sheets of about one-eighth of an inch in thickness. The rough edges are then trimmed, and the sheets sorted into four qualities and several sizes; the best "ruby" mica, which is unaffected by high temperatures, being worth 20*s.* per pound when in large sheets, while small sheets only fetch 2*d.* per pound. The uses are well known, and the consumption is now increasing, but appears to have been greater in early times. The output was given by Dr. McClelland in 1849 as 100,000 maunds, or about 73,000 cwts., and is estimated by Mr. Mervyn Smith at less than 20,000 cwts. in 1895. He also states that nearly all the mica used in the arts comes from these mines.

IN the *Verhandlungen der k.k. geologischen Reichsanstalt* (Wien) for November 30, 1898, Herr A. Bittner contributes an interesting description of some fish remains collected by him from the Hallstätter Kalk of Mühlthal bei Piesting. Though the fossils here dealt with consist only of isolated teeth, every such addition to our knowledge is welcome, for, as pointed out by the author, these remains are but rarely met with in the Alpine Trias. While Rhætic forms have been recorded by Gümbel, and later by Zugmayer, from the Kössener Schichten, and Stur discovered a *Ceratodus* skull, later described by Teller, at the base of the Lunzer Schichten, no fish remains whatever, as far as the author is aware, have hitherto been chronicled from the Hallstadt limestones. The teeth, illustrated by text figures, are referred to the genera *Sargodon* and *Hybodus,* and are regarded as representing new species. In the same number of the *Verhandlungen* are papers by Dr. W. Salomon, discussing the age of the Asta granite; and Herr F. Kerner, who describes several Culm plants from the Dachschiefer near Johannesbad. Herr F. Schaffer records the occurrence of Miocene strata in the neighbourhood of Siegenfeld, and, on the evidence of fossils obtained from well sinkings, correlates the beds with the Tegel of Baden.

M. PAUL MILLET, writing in the *Revue scientifique* of January 14, discusses the causes of the disappearance of insectivorous birds and the best means of prevention. These causes are twofold in nature, viz. natural causes tending to maintain the balance of nature, and artificial causes due to human agency, to which latter the author chiefly attributes the phenomenon in question. The means of prevention are also of two kinds: methods of a persuasive character, and legislative measures. Among the former may be cited (1) the teaching of ornithophily in schools and colleges; (2) the posting of printed notices; (3) introduction of books on birds into public libraries; (4) recommendation to teachers in primary schools to insist on the utility of preserving birds and nests. These means are all considered quite inadequate to deal with the evil, and M. Millet considers it desirable to enforce existing laws on the subject (1) by the passing of a regulation forbidding the capture or sale of birds smaller than the lark; (2) by suppressing the privileges sometimes granted for snaring birds in snowy weather; (3) by forbidding the sale of instruments for capturing small birds; (4) by enforcing vigilance on the part of gendarmes and police throughout the year; (5) by the seizure of small birds at the octroi, in railway stations or in markets; (6) by taking similar measures against milliners; (7) by the protection of birds of passage when landing, a measure in which Custom-house officers could assist; and (8) by killing birds of prey and animals which attack eggs. It is suggested that the French "Ligue Ornithophile" might materially assist in such measures, the need of which is far more urgent in France than in this country.

To rid beech-trees of that dangerous parasite *Cryptococcus fagi,* which causes much anxiety to foresters, many methods have been tried. Solutions of soft soap, methylated spirit, and so on, applied to the skin of the tree, are of no avail when the bark has become much decayed. External remedies having in such cases proved useless, Mr. John Shortt, the head forester upon the estate of Sir Matthew White Ridley, Bart., has tried internal ones, and the results are mentioned in the recently-published volume of *Transactions* of the English Arboricultural Society. Thirty years ago several trees which were in the last stages of decay were selected, and three holes were bored in the trunk of each, about two feet from the ground, slanting downwards, and converging towards a common centre. Sulphur, saltpetre, and other substances were placed in the holes —sulphur in one tree, saltpetre in another, and something else in a third—and the holes were then securely plugged. All the trees died except the one that had been treated with sulphur. Since these experiments several other beeches have been treated in the same way, and with equally satisfactory results. The operation, it may be added, is performed in the autumn. These experiments in practical forestry have excited great interest among foresters. It is hoped that the matter will be taken up in a scientific way, and that the chemical action of the impregnated sap will receive elucidation in a form which will be of practical use to the owners of woodlands throughout the country.

Bulletin No. 4 (vol. iv.) of the Laboratories of Natural History of the State University of Iowa is entirely occupied by two papers: On the Cyperacea of Iowa, by Mr. R. J. Cratty; and on American Uredineæ (part 2), by Messrs. J. C. Arthur and E. W. D. Holway. Both papers are well illustrated.

WE have received the *Proceedings* of the Agricultural Research Association for 1898. In its report, the Committee calls especial attention to the experiments carried on by the Association, under the direction of Mr. Thomas Jamieson, on the cross-fertilisation of the oat, resulting in the production of new valuable varieties by natural cross-pollination rather than by any artificial assistance.

AMONG the lectures to be delivered at the Royal Victoria Hall, Waterloo Road, on Tuesday evenings during March, are the following:—March 7, "The Scenery of Alpine Lands," Mr. E. J. Garwood; March 14, "The Atmosphere," Morris W. Travers; March 28, "Mont Blanc, the Great White Mountain," Mr. J. Russell.

AMONG the papers in the winter number of *Brain*, is the presidential address delivered to the Neurological Society by Prof. Victor Horsley, F.R.S., on the determination of the energy developed by a nerve centre, and a contribution on an experimental study of visions, by Dr. Morton Prince.

UNDER the title of "An experiment in commercial expansion," Mr. Leonard Courtney, M.P., delivered in December last a presidential address to the Royal Statistical Society, dealing with the economic lessons taught by a study of the commerce and development of the Congo Free State. The address is now published in the Society's *Journal*.

A BRIEF summary has been published at Philadelphia of a voluminous report drawn up for the Japanese Government by Tentearo Makato on "Japanese notions of European political economy." The report contains, *inter alia*, a summary of the main views of leading political economists as they presented themselves to the mind of the Japanese Commissioner.

A BI-MONTHLY magazine devoted to the study and protection of birds, edited by Mr. Frank M. Chapman, and published by the Macmillan Company, New York, has just appeared under the title of *Bird Lore*. The journal will be the organ of the Audubon Societies, and will provide students of bird-life with interesting articles and notes and pictures. The fact that during the past six years New York and Boston publishers have sold more than seventy thousand text-books on birds, promises success to this popular journal of ornithology.

IN a recent note in these columns attention was drawn to the reported discovery by M. Jaubert of a substance capable of removing from the air of a closed chamber the carbonic acid, water vapour and other irrespirable gases produced by a living animal within the chamber, and at the same time of keeping up the supply of oxygen. In the *Comptes rendus* for February 6, the subject is referred to in two communications. MM. Desgrez and Balthazard describe experiments made with sodium peroxide. This substance is acted upon by water according to the following equation, $Na_2O_2 + H_2O = 2NaOH + O$. The caustic soda produced will, of course, absorb carbon dioxide. A guinea-pig weighing 400 grammes, when enclosed in 10 litres of air, was asphyxiated in from two to two and a half hours; but under similar conditions when sodium peroxide was placed in the enclosure, and water allowed to drop on it, a guinea-pig showed no diminution of vitality at the end of four hours. To see if the moisture of expired air would suffice to act on the peroxide, two guinea-pigs were enclosed in 30 litres of air with 66 grammes of peroxide. They were taken out alive at the end of ten hours, whereas two others of the same weight died at the end of four hours in the absence of peroxide. Finally a dog weighing 6·5 kilogrammes, enclosed with 70 litres of air and 200 grammes of peroxide, gave unequivocal signs of life at the end of six hours. The peroxide was only attacked superficially in the last cases, owing probably to the formation of a protective layer of carbonate.

IN discussing the above experiments, M. d'Arsonval points out that seventeen years since he proposed an effective method of achieving the same end. The animal is enclosed hermetically in a tubulated receiver; the upper part of this contains a receptacle filled with pieces of soda-lime; through the tubulus a solution of hydrogen peroxide, coming from a Mariotte's bottle, is conducted by a tube so as to drop into a strong solution of chromic acid. The apparatus works automatically, for as the animal breathes and the carbon dioxide and water are absorbed by the soda-lime, the pressure falls and the Mariotte's bottle comes into action. The hydrogen peroxide solution then begins to drop into the chromic acid, and disengages oxygen until the pressure is restored. The flow from the Mariotte's bottle then stops, and the cycle begins again.

THE additions to the Zoological Society's Gardens during the past week include a Rhesus Monkey (*Macacus rhesus*, ♀) from India, presented by Mrs. A. J. Pauley; a Mozambique Monkey (*Cercopithecus pygerythrus*, ♂) from East Africa, presented by Mr. E. Tudor Johnson; a Bonnet Monkey (*Macacus sinicus*, ♀) from India, presented by Mr. J. H. Howden; a Coypu (*Myopotamus coypus*) from South America, presented by Mr. Sidney Grey; a Restless Cavy (*Cavia porcellus*) presented by Miss Druce; a Canadian Lynx (*Felis canadensis*); a Prairie Wolf (*Canis latrans*) from North America, presented by Mr. Henry Anger; two Mountain Ka-Kas (*Nestor notabilis*) from New Zealand, presented by the Hon. Walter Rothschild, M.P.; an Alexandrine Parrakeet (*Palaeornis alexandri*, ♀) from India, presented by Mr. A. Pam; a Beccari's Cassowary (*Casuarius beccarii*) from Vokan Island, Aru Islands; a Mauve-necked Cassowary (*Casuarius violicollis*) from Terangan Island, Aru Islands; a Salvadori's Cassowary (*Casuarius salvadori*), a Milne-Edwards Cassowary (*Casuarius edwardsi*) from North-west New Guinea, two Yellow-naped Cassowaries (*Casuarius occipitalis*) from the Island of Geelvink Bay, New Guinea; three Reeves's Terrapins (*Damonia reevesi*); three Black-headed Terrapins (*Damonia reevesi unicolor*) from China, deposited; two Red-breasted Mergansers (*Mergus serrator*, ♂ ♀), European; two Bahama Ducks (*Poecilonetta bahamensis*) from South America, nine Spotted-billed Ducks (*Anas poecilorhyncha*), a Bar-headed Goose (*Anser indicus*) from India, five Brent Geese (*Bernicla brenta*), European, purchased.

OUR ASTRONOMICAL COLUMN.

UNITED STATES NAVAL OBSERVATORY.—Prof. A. N. Skinner, one of the staff of this well-known observatory, contributes to *Science* (vol. ix., No. 210, pp. 1–16, January 6) a detailed history of the institution from its first inception to the present time. He divides the time into four periods, each characterised by some decisive change, both in the scope and administration of the department. In 1823, J. Quincey Adams,